Claim Amendments:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)

2. (Currently Amended) An IBAD apparatus for cooling and positioning a translating substrate during a continuous high-throughput coating deposition process comprising:

a deposition chamber comprising a vacuum chamber, a gas inlet, a source of deposition material for coating the substrate;

a transport system for translating a substrate to be coated, along a first direction through the deposition chamber;

a substrate block for positioning the substrate in a deposition zone where deposition material impinges upon the surface of the substrate, wherein the substrate block includes a sapphire wave guide and has an integrated structure containing both internal liquid coolant channels and internal gaseous coolant delivery channels, ~~and~~ the internal gaseous coolant delivery channels are connected by a manifold to the gas inlet ~~and where the internal gaseous coolant delivery channels extend through the substrate block along a portion thereof, the internal gaseous coolant delivery channels have a length, are hollow along the entirety of said length,~~ and extend to respective openings at positions spaced apart from each other at a first surface of the substrate block where the substrate block contacts the translating substrate, the openings are equally spaced apart with respect to each other along a second direction perpendicular to the first direction;

a pyrometer optically connected to the sapphire wave guide and configured to measure a temperature of the substrate; and

an ion beam source for imparting a biaxial texture in the deposition material.

Claims 3-6 (Canceled)

7. (Previously Presented) The apparatus of claim 2 where the diameter of the openings are in the range of from about 0.025 to about 0.4 inches.

8. (Previously Presented) The apparatus of claim 2 where the diameter of the openings are in the range of from about 0.05 to about 0.25 inches.

9. (Previously Presented) The apparatus of claim 2 where the diameter of the openings are in the range of from about 0.075 to about 0.175 inches.

10. (Previously Presented) The apparatus of claim 2 where the multiple openings are located no more than three inches apart.

11. (Previously Presented) The apparatus of claim 2 where there the multiple openings are positioned such that there are from one to about twelve orifices every three inches.

Claims 12-25 (Canceled)

26. (Currently Amended) An IBAD apparatus comprising:

a deposition chamber comprising a vacuum chamber, a gas inlet, a source of deposition material for coating the substrate, and an energy source for delivering deposition material to a tape;

a transport system for translating the tape, along a first direction through the deposition chamber;

a substrate block for positioning the tape in a deposition zone where deposition material impinges upon the tape, the substrate block having a first surface and an integrated structure containing both internal liquid coolant channels and internal gaseous coolant delivery channels, wherein the first surface of the substrate block has a radius of curvature of about 20 feet along the first direction and includes an array of orifices, the orifices of the array of orifices being spaced apart from each other along the first direction and a second direction perpendicular to the first direction, wherein the internal gaseous coolant delivery channels ~~extend through the substrate block along a portion thereof, the internal gaseous coolant delivery~~

~~channels have a length, are hollow along the entirety of said length, and~~ extend to the array of orifices to deliver a flow of gas to a backside of the tape translating across the first surface of the substrate block, the orifices are equally spaced apart from each other along the second direction; and

an ion beam source for imparting a biaxial texture in the deposition material.

27. (Previously Presented) The IBAD apparatus of claim 26, wherein the internal gaseous coolant delivery channels terminate at a surface of the substrate block in the form of nozzles.

28. (Previously Presented) The IBAD apparatus of claim 27, wherein the nozzles are spaced apart along a length of the substrate block.

29. (Previously Presented) The IBAD apparatus of claim 26, wherein the source of deposition material contains deposition material selected from the group consisting of YSZ, MgO and CeO_2.

30. (Previously Presented) The IBAD apparatus of claim 29, wherein deposition material comprises MgO.

31. (Previously Presented) The IBAD apparatus of claim 26, wherein internal gaseous coolant delivery channels contain and deliver gaseous coolant selected from the group consisting of N_2, Ar, He, and O_2.

32. (Previously Presented) The IBAD apparatus of claim 2, wherein the openings are arranged in an array and are spaced apart from each other along the first direction.

33. (Currently Amended) An IBAD apparatus for cooling and positioning a translating substrate during a continuous high-throughput coating deposition process comprising:

a deposition chamber comprising a vacuum chamber, a gas inlet, a source of deposition material for coating the substrate;

a transport system for translating a substrate to be coated, along a first direction through the deposition chamber;

a substrate block for positioning the substrate in a deposition zone where deposition material impinges upon the surface of the substrate, wherein the substrate block includes a sapphire wave guide and has an integrated structure containing both internal liquid coolant channels and internal gaseous coolant delivery channels, the internal gaseous coolant delivery channels are connected by a manifold to the gas inlet and extend through the substrate block along a portion thereof to respective openings at positions spaced apart from each other at a first surface of the substrate block where the substrate block contacts the translating substrate, the gaseous coolant delivery channels each have a length extending from the manifold to the respective openings and are straight and hollow along the entirety of said length, the first surface of the substrate block having a radius of curvature of about 20 feet along the first direction;

a pyrometer optically coupled to the sapphire wave guide and configured to measure a termpature of the substrate while translating;

a controller configured to alter a flow of gas through the gaseous coolant delivery channels in response to the temperature of the substrate measured by the pyrometer; and

an ion beam source for imparting a biaxial texture in the deposition material.